

REMARKS

Subsequent to entry of the foregoing amendments, claims 1 and 3-12 are presently pending in this application. New claims 7-12 are introduced via this Amendment. Claim 2 is hereby cancelled.

New claims 7-12 provide more varied protection for the subject invention. Claim 7 is the same as claim 4, but depends from claim 3. Claims 8 and 9 are the same as claim 5, but depend from claims 3 and 4, respectively. Claims 10-12 are the same as claim 6, but depend from claims 3-5, respectively.

The Examiner objects to the disclosure based on the informality noted in numbered paragraph 1 on page 2 of the Office Action. The foregoing amendments to the specification are believed to render this objection moot.

Applicants respectfully traverse the rejections under 35 U.S.C. §§102(a) and (b).

As described and claimed herein, the present invention is directed to a pneumatic tire, in which, for variations of tire axle force, which are caused by portions discontinuous in terms of rigidity, such as lug grooves, reverse axle force is generated, and thus pattern noise resulting from the portions discontinuous in terms of the rigidity on a tread portion is reduced.

Amended claim 1 further clarifies the invention in accordance with the description at page 10, lines 1 to 9 in the instant specification. As set forth therein, the pneumatic tire has the important feature that the rigidity changing portions include protruding portions that are formed

on a wall surface of the rib groove and increase rigidity against tread compression. Each protruding portion protrudes from the wall surface so that a planar shape of the protruding portion forms a substantially circular arc with a planar surface on a tip and a cross section of the protruding portion forms a substantially triangular shape in a manner that a protruding amount is gradually reduced from a bottom surface of the rib groove toward an opening portion of the rib groove.

With this feature, the variations of the tire axle force, which are caused by the discontinuous portions, are restricted by the rigidity changing portions and, eventually, vibrational force to an axle is lowered, and pattern noise caused thereby can be reduced effectively.

Further, since the protruding portion has a planar surface on a tip thereof, the protruding portion has the following effects.

For example, when a lug groove constituting the rigidity changing portion approaches a footprint, there is a relation between the variation of the tire axle force due to the lug groove 13 and a change of length that a footprint line position K (see Fig. 1) traverses the lug groove. The change of length becomes a trapezoid because the shape of the lug groove 13 is substantially parallel. Thus, it is effective to form a planar surface constituting a trapezoid on the top of the protruding portion 20 in order to efficiently compensate the variation of the tire axle force with the rigidity due to the shape of protruding portion 20.

As shown in the attached explanatory figure, the footprint line K moves as shown with the dotted lines as the tire rotates. In this case, the variation of the tire axle force depends on how much the dotted lines pass the lug groove 13 in the range designated by an arrow A. Since there is no lug groove at the portion above the most upper dotted line K2 and the portion below the lowest dotted line K1, there is no variation of the tire axle force at these portions. However, when the footprint line K goes into a portion including the lug groove 13, the tire axle force gradually changes to become the maximum at the portion E. Since the variation of the tire axle force is the maximum at the portion E, the protruding portion 20 has a planar surface at this portion corresponding to the portion E.

JP '712 shows platforms 20A, 20B, 20C located in circumferential groove 14, allegedly corresponding to the rigidity changing portions of the claimed invention. However, the platforms 20A, 20B, 20C are formed on the bottom of the circumferential grooves, not on the wall surfaces of the rib groove.

Canada '627 shows projections 15 allegedly corresponding to the claimed rigidity changing portions. However, the shape of the projections 15 is very different from those of the protruding portions of the claimed invention. That is, Canada '627 fails to disclose or suggest the shape of the protruding portions of the claimed invention as described above.

Rohweder shows protrusions 20 allegedly corresponding to the rigidity changing portions. However, the shape and size of the protrusions 20 are completely different from those of the claimed invention. Namely, Rohweder fails to disclose the shape of the protruding portions of the claimed invention described above.

Pogue shows offset/axially extending segments 34 allegedly corresponding to the rigidity changing portions. However, the shape and size of the offset/axially extending segments 34 are completely different from those of the claimed invention. Pogue fails to disclose or suggest the shape of the protruding portions of the claimed invention described above.

As discussed previously, the Examiner's cited references do not disclose or fairly suggest the claimed invention and, thus, cannot achieve the effects of the claimed invention.

For at least the foregoing reasons, claim 1 is believed to be allowable, and claims 3-12 are believed to be allowable at least by virtue of their dependency, directly or indirectly, from claim 1.

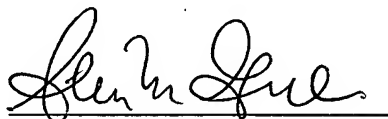
In view of the preceding amendments and remarks, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue that the Examiner feels may be best resolved through a personal or telephonic interview, he is kindly requested to contact the undersigned attorney at the local telephone number listed below.

AMENDMENT UNDER 37 C.F.R. §1.111
U.S. SERIAL NO. 10/501,560

ART UNIT 1733
Q82518

The USPTO is directed and authorized to charge all required fees (except the Issue/Publication Fees) to our Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Steven M. Gruskin
Registration No. 36,818

SUGHRUE MION, PLLC
Telephone: 202-293-7060
Facsimile: 202-293-7860

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23373

CUSTOMER NUMBER

Date: July 24, 2006